Transport & Air Mass Characterization

What are the important mechanisms for export of Asian pollution to the Pacific, and what are the roles of topography, frontal lifting, convection in delivering Asian emissions to the free troposphere?

Current/Planned Analysis and Papers:

- **Warm conveyor belt case studies (Many)**
- **Convective outflow case studies (UW, CNRS)**
- **In situ and remote observations of large-scale atmospheric characteristics as they relate to different transport mechanisms (Many)**
- **Model analysis of transport mechanisms (temporal and spatial contributions to outflow-including topography) (UI, FSU, Harvard)**

Outstanding Problems:

- **Post frontal flows relative to subsequent outflow regimes**
- **Convective outflow level predictions - use IR temperatures or statistical techniques to analyze**

What is the contribution of biomass burning to the outflow, and how does it overlap with contributions from other sources?

Current/Planned Analysis and Papers:

- **Combine in situ and remote measurements with model results to look at chemistry in bb plumes (Many)**
- **Models are predicting the spatial and chemical composition of bb outflow (Harvard, UC-I, UI)**

Outstanding Problems:

- **Signatures are relatively weak (HCN as unique tracer?) and bb plumes are mixing into upwind air masses (Harvard, NCAR)**
- **How to quantify the outflow from bb uniquely (Harvard, UI)**

What is the contribution of stratospheric air to the outflow, and how does it overlap with contributions from other sources?

Current/Planned Analysis and Papers:

- **Air mass characteristics from O3-PV relationships (DIAL)**
- **Small-scale structure of STE using in situ & modeled results (LaRC)**
- **Combination of modeled strat-trop exchange with DIAL and TOMS measurements (LaRC-UW, UC-I)**
- **Sensitivity analyses associated with strat-trop exchange and conservative nature of PV (UC-I, LaRC-UW)**

Outstanding Problems:

- **Use of satellite data for understanding STE on larger scales (GSFC, LaRC-UW)**

Is there evidence for outflow of European or African air masses?

Current/Planned Analysis and Papers:

- **Meteorological analysis of long-range transport (FSU)**
- **Modeling of relative contributions to outflow from E/A (Harvard, Max-P)**
- **In situ chemical analyses (UC-I, ...)**

Outstanding Problems:

- **Lack of unique chemical tracers for bb in Africa vs SE Asia and between Europe vs Japan**

How does the chemical composition of the Asian outflow evolve during transport across the Pacific?

Current/Planned Analysis and Papers:

- **Remote DIAL and TOMS O3 & aerosol distributions across Pacific inferring chemical evolution conditions (DIAL, GSFC)**
- **In situ chemical composition combining results from different flights to get at chemical/compositional evolution across Pacific using meteorological analysis and models to connect the air masses (Many)**
- **Few cases studies associated with chemical evolution (Jaffe, Avery, LaRC-UW)**
- **Chemical modeling of transport across Pacific (UC-I, Harvard, UI)**

Outstanding Problems:

- **Lack of adequate data sets for doing large-scale chemical evolution studies**

How does 2001 compare to other years? What is the role of ENSO?

Current/Planned Analysis and Papers:

- **Meteorological analysis of different ENSO phases and representativeness of 2001 (FSU, Avery, Max-P)**
- **TOMS O3 and aerosol characteristics (GSFC)**
- **Ozonesonde records to give variability in chemistry over Pacific (NOAA)**
- **MOPITT (2001 & 2000) & MAPS (1994) for CO distributions**
- **Gnd-based remote measurements (Jap.)**
- **Compared TP and PWB results (Many)**
- **Model comparisons to investigate the chemical and transport characteristics between 2001 and previous years including PWB (Harvard, ...)**

Outstanding Problems: